

CLAIMS:

1. A method for producing a modified glutenin or seed-storage protein, the method comprising adding to the protein an exogenous amino acid domain which confers to the modified protein the ability to bind a ligand or other macromolecule, wherein the modified protein has an ability to incorporate into gluten.
2. The method according to claim 1 wherein the domain includes one or more cysteine residues.
3. The method according to claim 1 wherein one or more cysteine residues are incorporated at one or both ends of the amino acid sequence of the protein.
4. The method according to claim 1 wherein the modified protein further comprises one or more exogenous amino acid residues which confer to the protein an enhanced ability to incorporate into gluten.
5. The method according to claim 1 wherein the ligand or other macromolecule to which the domain binds is selected from the group consisting of lipid, and starch.
6. The method according to claim 5 wherein the domain capable of binding lipid is derived from barley oleosin gene or the lipid-binding regions of wheat CM16 protein.
7. The method according to claim 5 wherein the domain capable of binding starch is derived from glucoamylase from *Aspergillus niger*.
8. The method according to any one of claims 1 to 7 wherein the glutenin or seed-storage protein is selected from the group consisting of low molecular weight glutenins, high molecular weight glutenins, gliadins, puroindolines, grain softness proteins, friabilins, and Chloroform/Methanol-soluble proteins.
9. The method according to claim 8 wherein the glutenin or seed-storage protein is C hordein from barley.
10. A modified glutenin or seed-storage protein having an ability to incorporate into gluten and having an exogenous amino acid domain inserted therein which confers to the modified protein the ability to bind a ligand or other macromolecule produced by the method according to any one of claims 1 to 9.

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11. A modified glutenin or seed-storage protein having an ability to incorporate into gluten and having an exogenous amino acid domain inserted therein which confers to the modified protein the ability to bind a ligand or other macromolecule.

5 12. A modified glutenin or seed-storage protein according to claim 11 wherein the ligand or other macromolecule to which the domain binds is selected from the group consisting of lipid and starch.

10 13. A modified glutenin or seed-storage protein according to claim 12 wherein the domain capable of binding lipid is derived from barley oleosin gene or the lipid-binding regions of wheat CM16 protein.

14. A modified glutenin or seed-storage protein according to claim 12 wherein the domain capable of binding starch is derived from glucoamylase from *Aspergillus niger*.

15 15. A modified glutenin or seed-storage protein according to any one of claims 10 to 14 wherein the glutenin or seed-storage protein is selected from the group consisting of low molecular weight glutenins, high molecular weight glutenins, gliadins, puroindolines, grain softness proteins, friabilins, and Chloroform/Methanol-soluble proteins.

20 16. A modified glutenin or seed-storage protein selected from the group consisting of ANG/SBD/Cys7Cys236, ANG/OHBD/Cys7Cys236, and ANG/CM16/Cys7Cys236, as hereinbefore defined.

17. An isolated nucleic acid molecule encoding a modified glutenin or seed-storage protein according to any one of claims 10 to 16.

25 18. A cell containing an isolated nucleic acid molecule according to claim 17 such that on expression of the nucleic acid molecule, the cell produces the modified glutenin or seed-storage protein.

19. The cell according to claim 18 selected from the group consisting of bacteria, yeast, plant, insect, and mammal.

20. The cell according to claim 19 being *Escherichia coli*.

30 21. The cell according to claim 19 being *Pichia* sp. or *Saccharomyces cerevisiae*.

22. The cell according to claim 19 being a recombinant wheat cell.

23. Use of a modified glutenin or seed-storage protein according to any one of claims 10 to 16 in the preparation of a food product.

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24. The use according to claim 23 wherein the food product is selected from the group consisting of leavened or unleavened breads, pasta, noodles, breakfast cereals, snack foods, cakes, pastries, and foods containing flour-based sauces.

25. Use of a modified glutenin or seed-storage protein according to any one of claims 10 to 16 in the preparation of a non-food product.

26. The use according to claim 25 wherein the non-food product is selected from the group consisting of films, coatings, adhesives, building materials, and packaging materials.

27. Use of a grain or part of a grain containing a modified glutenin or seed-storage protein according to any one of claims 10 to 16 in the preparation of a food product.

AMENDED SHEET
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